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(71) Applicant (for all designated States except US): THE MEAD CORPORATION [US/US]; Courthouse Plaza, Northeast, Dayton, OH 45463 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): STOUT, James, T. [US/US]; Route 6, Box 2265, Ellijay, GA 30540 (US).

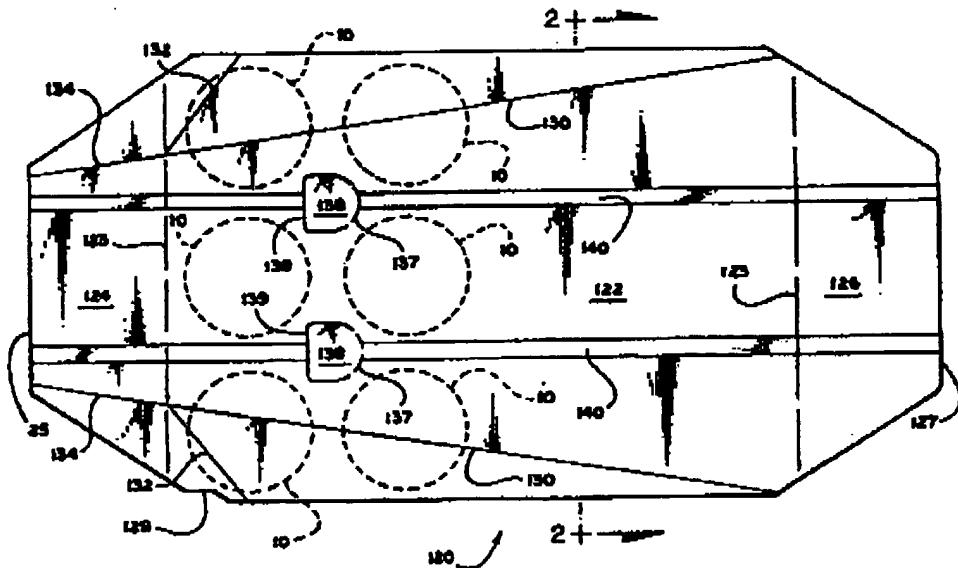
(74) Agents: DREW, Michael, V. et al.; The Mead Corporation, 4850D North Church Lane, Smyrna, GA 45463 (US).

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(54) Title: REINFORCED DIVIDER PANEL FOR MULTIPLE-TIER ARTICLE PACKAGE



(57) Abstract

A divider panel (120) for a multiple-tier article package has debossed channels (140) formed in and longitudinally extending along the length of a major panel (122) along a line contained in a plane of adjacency extending between adjoining rows of articles (10). Anchor flaps (124, 126) for securing the panel (120) are attached to the major panel (122) along perforated lines (123) that permit the anchor flaps (124, 126) and major panel (122) to be separated from one another. The divider panel (120) is scored with lines (130, 132, 134) that together with the channels (140) encourage bending of the divider panel (120) about axes defined by the debossed channels (140) and scored lines (130, 132, 134). One or more apertures (137) in the major panel (122) enable a finger or fingers to be inserted to facilitate removal of the major panel (122) or the entire divider panel (120) from the carton.

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**REINFORCED DIVIDER PANEL FOR MULTIPLE-TIER ARTICLE
PACKAGE**

Background of the Invention

The invention relates generally to packages of articles such as beverage cans or similar containers arranged in two or more tiers separated by a divider panel, and more particularly to a reinforced divider panel for such packages.

In merchandising articles such as cans of beverage it is often desirable to package multiple articles in a single container for distribution and sale. To encase a substantial number of articles such as beverage cans it is convenient to arrange the cans in two or more tiers in a single package. A divider panel is useful in a package enclosing two or more tiers to separate the bottoms of one tier of articles from the tops of a lower tier of articles. Separation of tiers of articles provides a stronger, more reliable package overall. In many instances it is simply undesirable for articles, such as cans, on one tier to be in contact with articles on another tier.

In using a divider panel to separate tiers of articles in a package it is desirable to have a panel that is sturdy enough to resist deformation both during installation into the package and while in place separating tiers of articles. A divider panel may possibly be bent during installation because the panel is generally a single sheet

that must be manipulated by machinery and arranged between arrays of objects that are normally heavier than the panel itself. While in place, the divider panel may be subjected to deforming forces from the articles it separates. Some 5 articles, such as beverage cans, are designed so that the tops and bottoms of articles in adjacent tiers are telescopically nestable within one another. When using a divider panel to separate tiers of nestable articles the divider panel may become deformed as the weight of the 10 upper tier or tiers of articles causes the articles to attempt to nest. This deformation of the divider panel out of the plane of the panel is undesirable. Downward depression of a divider panel by cans would decrease the overall volume originally occupied by the cans and panel 15 within the carton. The tight fit and separation desirable in packaging and transporting beverage cans may not be achieved if the overall volume of the encased cans for which the carton was designed decreases after packing.

In using a divider panel, the ends of the divider 20 panel may be anchored by an adhesive or other means to the inner surface of the carton to prevent unwanted movement of the panel and to further increase the overall stability of the package. When the package is used as a dispenser 25 beverage cans or other encased articles may be removed from the package through an opening in the carton created by lifting a flap. Once the package is opened, cans are normally removed first from the topmost tier through the opening in the carton wall. After cans have been removed

from the topmost tier the anchored divider panel must be removed to gain access to the cans on a lower tier of the package. Thus, although an anchored divider panel is useful for segregating successive tiers of cans, it may 5 also prevent access to lower tiers of cans when the package is used as a dispenser. It would be desirable to have a divider panel that is not only sturdy but which can be secured within a package and easily removed to dispense articles from the package.

10 What is needed, therefore, is a divider panel for a package for multiple tiers of articles that is reinforced to resist deformation. What is also needed, is a reinforced divider panel that may be secured within a package but easily removed to gain access to a tier of 15 articles beneath the divider panel.

Summary of the Invention

The present invention provides a divider panel having channels as a means of reinforcement. In a preferred embodiment which is removable from a package a divider 20 panel has "debossed" channels extending along its length. Anchor flaps are attached to each end of the major panel for securing the panel in a multiple-tier article package. The anchor flaps are attached to the major panel along perforated lines that allow the anchor flaps and major 25 panel to be separated from one another. The divider panel is scored with lines that together with the debossed

channels encourage bending of the divider panel about axes defined by the scored lines and debossed channels. One or more apertures in the major panel enable a finger or fingers to be inserted to facilitate removal of the major panel or the entire divider panel from the carton.

5 Other advantages and objects of the present invention will be apparent from the following description, the accompanying drawings, and the appended claims.

Brief Description of the Drawings

10 Fig. 1 is a plan view of a reinforced removable divider panel in accordance with a preferred embodiment of the present invention.

Fig. 2 is a sectional view of the divider panel of Fig. 1, taken along line II-II thereof.

15 Fig. 3 is a perspective view of two tiers of cans separated by the reinforced removable divider panel of Fig. 1, wherein the two tiers of cans are partially arranged for placement within a carton.

20 Fig. 4 is a perspective view of the two tiers of cans and divider panel shown in Fig. 3, wherein the two tiers of cans are arranged over one another for placement within a carton.

Fig. 5 is a partial sectional view of the two-tiered array of Fig. 4.

Fig. 6 is a plan view of the outer surface of a blank for forming a carton within which the tiers of cans and panel of Fig. 4 will be placed.

5 Fig. 7 is a perspective view of an erected sleeve formed from the blank of Fig. 6, showing the open ends of the sleeve partially closed and the position of an anchor flap for the panel ready for closure of the package.

Fig. 8 is a perspective view of a completed package containing the divider panel of Fig. 1.

10 Fig. 9 is a perspective view of the package of Fig. 8, showing the divider panel of Fig. 1 as seen through an end opening of the carton providing access to the upper tier of the two-tier package.

15 Fig. 10 is the same view as Fig. 9, showing the divider panel partially curled and partially removed from the carton.

Detailed Description of the Preferred Embodiment

The present invention is intended primarily for use in separating adjacent tiers of articles in a paperboard carton forming a multiple-tier package. The invention contains a reinforcement feature to limit or prevent deformation when articles are loaded upon the divider panel. The invention is particularly suitable for use with multiple tiers of aluminum or steel beverage cans having nestable tops and bottoms and, although more broadly applicable, for convenience will be explained in this

context. A typical can is denoted throughout the drawings by the numeral 10. The typical can 10 generally has a single-piece, seamless drawn body with a top lid and a lower covered end. The tops and bottoms of cans are 5 generally nestable with one another. The top lid is generally recessed within a peripheral flange while the bottom end typically forms a protruding ring of a diameter smaller than the diameter of the peripheral flange. Thus enabling the bottom ring of an upper tier can to nest 10 within the peripheral flange of the top of a lower-tier can.

The reinforced removable divider panel of a preferred embodiment of the invention is constructed so that it may be easily withdrawn through an opening into the carton 15 through which individual cans may be removed. The panel is reinforced against planar deformation by means of debossed channels and has a main panel that may be torn away from anchor flaps which secure the panel in the carton. The panel is designed to be bent or curled in a manner that 20 makes removal easier. In the drawings and description which follow, although the divider panel is described for use in conjunction with typical cartons, it will be clearly understood that the panel of the invention may be used with cartons having configurations differing from those 25 described herein.

Referring first simultaneously to Figs. 1 and 2, therein is illustrated a reinforced removable divider panel 120 for a multiple-tier can package according to a

preferred embodiment of the invention. The divider panel 120 illustrated is suitable for use with an elongated array of cans 10 such as the 3 x 4 array shown in Fig. 3. Channels 140 are formed in the panel 129 for reinforcement.

5 In the preferred embodiment the channels 140 are "debossed." By debossed is meant that, using the top surface of the panel 120 as a reference, channels 140 are "embossed" in a reversed manner projecting toward and outwardly from the underside of the panel 120. These

10 reinforcement channels 140 will be described in greater detail below following the description of other elements.

The divider panel 120 has a major panel 122 with anchor flaps 124, 126 attached at either end along respective perforated fold lines 123. The anchor flaps 15 124, 126 may be rectilinear but are shown in a configuration that permits maximum extension of each flap 124, 126 from its line of connection 123 at the major panel 122 while requiring as little construction material as possible. The inclined side edges of the anchor flaps 124, 20 126 cut off the corners of the anchor flaps 124, 126, thereby reducing the amount of material such as paperboard needed to produce the divider panel 120. The corners of the major panel 122 of the divider panel 120 are bevelled and coincide with the inclined edges of the anchor flaps 25 124, 126. The bevelled corners of the major panel 122 are configured to correspond to a carton having bevelled corners. The divider panel 120 also contains a notch 129

useful for distinguishing an end of the panel 120 during rapid alignment and placement of the panel 120 during packaging operations.

The divider panel 120 is scored with lines that
5 facilitate bending of the divider panel 120 about the scored lines. Although these scored lines may be arranged in many different patterns, the preferred embodiment illustrates an arrangement of a set of scored lines 130,
10 132, 134 that generally radiate from points on one of the fold lines 123. As will be discussed in greater detail below, when the divider panel 120 is positioned within a carton for use, the anchor flaps 124, 126 are folded downward and the fold lines 123 between the major panel 122 and the anchor flaps 124, 126 abut the inner walls of the
15 carton. The fold line 123 from which the scored lines 130, 132, 134, radiate becomes the end of the major panel 122 that will be removed first from the carton.

Although a single scored line may be used, use of multiple scored lines creates more individual sections that
20 are subject to easy bending. Two sets of scored lines 130, 132 radiate in a divergent pattern generally along the length of the divider panel 120. What may be considered a set of converging scored lines 134 (with respect to the manner in which they radiate from the fold line 123) extend across one of the anchor flaps 124 and coincide with one of the diverging sets of scored lines 130. The scored lines 134 in the anchor flap 124 are useful for promoting bending of the anchor flap 124 if the major panel 122 is to be

removed from the carton without first detaching that anchor flap 124.

A pair of apertures are formed in the major panel 122 by perforated cut lines 137. The apertures 137 become accessible by pushing through punch-out tabs 138 which remain connected to the major panel 122 of the divider panel 120 by scored fold lines 139. The apertures 137 are positioned upon the divider panel 120 such that they are aligned over the spacing existing between adjoining cans 10 of an array when the divider panel 120 is placed over that array of cans 10. To illustrate this alignment, Fig. 1 depicts, in phantom form, the peripheral flange at the tops of representative cans 10 of a tier upon which the panel 120 rests.

A pair of parallel debossed channels 140 extend along the length of the panel 120 through the main panel 122 and end flaps 124, 126. Referring now simultaneously to Figs. 1, 2, and 5, advantages produced by the channels 140 will be described. The channels 140 make the panel 120 more sturdy by functioning in the manner of corrugations in corrugated paperboard to resist bending of the panel 120 across the channels 140. Although one channel 140 may be used, multiple channels 140 provide additional reinforcement. Referring particularly now to Figs. 1 and 5, a number of channels 140 are employed sufficient to lie between adjacent rows of cans 10. When the panel 120 is used to separate tiers of beverage cans 10 having telescopically nestable top and bottom rims, the

reinforcement provided by the channels 140 enables the panel 120 to resist being pushed downward into the tops of the lower tier of cans 10. Downward depression of the panel 120 by cans 10 would decrease the overall volume occupied by the cans 10 and panel 120 within the carton. The tight fit desirable in packaging and transporting beverage cans 10 may not be achieved if the overall volume of the encased cans shrinks after packing. The panel 120 is thus able to perform the function of separating tiers of cans 10 while helping to maintain the stability of the package. In addition to reinforcing, the channels 140 serve a second purpose as fold lines about which the panel 120 may be curled, in the same manner as the scored lines 130, 132, 134 described above serve as fold lines.

In the preferred embodiment, the set of debossed channels 140 is essentially parallel to the sides of the major panel 122 while the two sets of scored lines 130, 132 radiate in a divergent pattern along the length of the divider panel 120. The debossed channels 140 extend through the length of the major panel 122 and each anchor flap 124, 126. The length of the panel 120 is its greatest dimension, making the panel 120 more subject to stress forces along that dimension. The debossed channels 140 in the anchor flaps 124, 126 are also useful for promoting bending of the anchor flaps 124, 126 if the major panel 122 is to be removed from the carton without first detaching that anchor flap 124, 126.

Referring now particularly to Figs. 3 and 4, therein is shown a manner in which the divider panel 120 may be positioned for use between two tiers of cans 10 in 3 x 4 arrays. In general, the panel 120 is positioned over the bottom tier of cans 10 so that the apertures 137 and punch-outs 138 are aligned over spaces between the tops and sides of the cans 10 of the first and second rows of the bottom tier. The upper tier of cans 10 may then be positioned over the lower tier, as shown in Fig. 4. Figs. 3 and 4 also illustrate the manner in which the anchor flaps 124, 126 (only one anchor flap 124 is visible in the views of Figs. 3 and 4) are folded downward so that it is easier to load the second tier of articles upon the panel 120 and so that the two-tiered stacked array is ready for loading into a carton.

Referring now to Fig. 6, therein is illustrated for the purpose of further describing operation of the features of the divider panel 120 of the preferred embodiment of the invention a typical blank 11 for forming a carton with which the divider panel 120 may be used. As has been previously mentioned and as will be discussed in more detail below, the divider panel 120 is designed to be withdrawn through an opening in the erected carton. In the discussion which follows, the panel will be described as being withdrawn through the opening created by removing the end opening flap 12 of the carton. The end opening flap 12 is defined by tear lines 13 inscribed in the end 66 and top 42 panels. A primary tear initiation slit 14 facilitates

tearing open of the end opening flap 12. A fold line 15 for the end opening flap 12 extends between the tear lines 13. Tearing open of the end opening flap 12 is further facilitated by and may be initiated through a tear initiation tab 16 defined by primary tear initiation slit 14, secondary tear initiation slit 18 and tear fold line 17. The central body of the carton is formed from central panels 40, 42, 48, 52, 56. The central panels are connected to one another by various respective fold lines 44, 46, 50, 54. The end walls of the erected carton are formed from end panels 58, 60, 66, 68, 74, 76, 82, 84, 90, 92 connected along respective fold lines 62, 64, 70, 72, 78, 80, 86, 88, 94, 96 at the sides of respective central panels 40, 42, 48, 52, 56. In the typical blank 11 illustrated, bevelled corner panels 102 become bevelled corners of the erected carton. As previously mentioned, the corners of the divider panel 120 may be bevelled to accommodate a carton having bevelled corners. The bevelled corner panels 102 are created by the addition of fold lines 100 parallel to the fold lines 78, 80, 86, 88, 94, 96 between end panels 74, 76, 82, 84, 90, 92 and their respective central panels 48, 52, 56. Additional support structure consists of webs 104 and the fold lines 105, 106 which help form them. For illustrative purposes, in addition to the end opening flap 12, a front opening flap 41 for removing cans 10 from an erected carton is also shown. The front opening flap 41 is defined by tear lines 43, 45. A front initiation slit 47 defines a pull tab 49

for facilitating tearing open of the front opening flap 41.

Referring now to Fig. 7, therein is shown the carton in its tubular configuration loaded with the two-tiered can 10 arrangement of Figs. 3 and 4. An adhesive 110, 112, 114, 116 is affixed to the various flaps and panels to seal the carton. Most notably, an adhesive 110 may be placed upon the anchor flaps 24, 126 (one anchor flap 126 is not shown) of the divider panel 120 to secure the anchor flaps 124, 126 to the respective end panels 66, 68 of the carton. The fully sealed carton enclosing the multi-tiered can 10 and divider panel 120 arrangement is illustrated in Fig. 8.

Referring now to Fig. 9, therein is shown the package formed from the carton, cans 10, and divider panel 120. The end opening flap 12 has been lifted to provide access to the interior of the package. The upper tier of cans 10 has been removed and the divider panel 120 is revealed. In this view, one of the debossed channels 140, a scored bend line 130 and one of the apertures 137 and its punch-out tab 138 can be seen.

Referring now to Fig. 10, the divider panel 120 is shown partially removed from the carton through the opening created by lifting the end opening flap 12.

In using the divider panel 120, the anchor flaps 124, 126 are immobilized to help secure the panel 120 in place in the carton. Although the anchor flaps 124, 126 of the divider panel 120 may be glued to the inner surfaces of the carton (as illustrated in Fig. 7) as a means for

securement, the anchor flaps 124, 126 may also be secured by the force exerted upon them when they are sandwiched between the cans 10 and walls of the carton. Once the upper tier of cans 10 has been removed from the package the major panel 122 of the divider panel 120 is accessible through the opening of the carton used to withdraw cans 10. The major panel 122 may be torn away from the immobilized anchor flaps 124, 126 along the perforated fold lines 123. Once the major panel 122 has been separated from the anchor flaps 124, 126, an individual may remove the major panel 122 from the carton by inserting fingers through the apertures 137 to grasp the major panel 122 and lift the major panel 122 through the opening of the carton as illustrated in Fig. 10. The apertures 137 may also be used to manipulate the major panel 122 to tear the major panel 122 away from the secured anchor flaps 124, 126. The major panel 122 is curled or bowed into a frustum-like shape so that it will be narrow enough to be withdrawn through the opening of the carton. When the major panel 122 is curled, the channels 140 and scored fold lines 130, 132 cause the major panel 122 to bend about the channel 140 and lines 130, 132. The major panel 122 may be easily curled into the frustum shape at the end first passing through the opening of the carton because of the pattern inscribed by the debossed channels 140 and scored fold lines 130, 132. As the scored fold lines 130, 132 diverge from the front end toward the rear end of the major panel 122, bending of the major panel 122 is less acute but sufficient to allow

the end of the major panel 122 to be curled under and easily withdrawn from the carton.

If the anchor flaps 124, 126 are not glued to the inner surface of the carton, the entire divider panel 120 including the anchor flaps 124, 126 may be lifted from the lower tier of cans 10 and removed from the carton. In this alternate form of removal, the debossed channels 140 and scored fold lines 134 enable the front anchor flap 124 to be bent about the channels 140 and fold lines 134 into a shape which becomes an upper portion of the frustum-shaped, curled panel 120. The bevelled configuration of the sides of each anchor flap 124, 126 helps produce a more tapered front for the curled panel 120. The channels 140 extending through the rear anchor flap 126 encourage bending about the channels 140.

The divider panel 120 may be used in several ways in conjunction with an opening in the front of the carton which is created by lifting the front opening flap 41. In one manner, the divider panel 120 and its various features may be oriented for placement and removal with respect to the front opening in the same manner as placement and removal from the end opening is achieved. In another manner, the front opening may be used to detach the major panel 122 from the anchor flaps 124, 126 or lift the entire panel from the lower tier, but removal of the major panel 122 or entire divider panel 120 from the carton can still be accomplished through the side opening.

Other modifications may be made in the foregoing without departing from the scope and spirit of the claimed invention. For example, although the reinforcement channels 140 have been described as being debossed, reversed 5 "embossed" channels or channels debossed from the bottom side would also be suitable. However, if the panel 120 is manufactured by a standard die stamping process the use of a "debossed" channel upon the upper surface of the panel 120 simplifies the die-stamping process. As another 10 example of a modification which does not depart from the scope and spirit of the invention, although preferred embodiments of the invention have been described with reference to beverage cans, the divider panel 120 may also be used to separate containers stackable in arrays similar 15 to the arrays of beverage cans 10 described above. Any containers which are compatible with the features of the divider panel 120 described herein are suitable. For example, the divider panel 120 may be used to separate tiers of individual-serving-size milk cartons which have a steeple-shaped top. When used to separate such containers, 20 the apertures 137 of the divider panel 120 provide access to the spacing between milk cartons and the tops of the milk cartons.

What is claimed is:

1. A divider panel for separating adjacent tiers of articles in a package for a plurality of articles, the articles arranged into a group of at least two vertically-disposed tiers, the group of tiers encased by a carton including top and bottom panels interconnected by side panels comprising:

a major panel having an area generally equal to a cross-sectional area of one tier of the group of at least two vertically-disposed tiers, having a front edge and a rear edge, having at least one channel extending from said front edge generally toward said rear edge;
10 and

means for releasably securing said major panel within the
15 carton.

2. A divider panel according to claim 1, wherein said at least one channel is debossed upon an upper surface of said major panel.

3. A divider panel according to claim 1, wherein said at least one channel is debossed upon a lower surface of said major panel.
20

4. A divider panel according to claim 1, wherein said at least one channel extends longitudinally through said major

25 panel along a line contained in a plane of adjacency
extending between adjoining rows of articles.

5. A divider panel for separating adjacent tiers of
articles in a package for a plurality of articles, the
articles arranged into a group of at least two vertically-
disposed tiers, the articles in a lower tier defining a
30 plurality of spaces extending below a plane which
intersects the tops of the articles, the group of tiers
encased by a carton including top and bottom panels
interconnected by side panels, at least one side panel
having a removable opening proximate the top panel for
35 removing the cans from the carton comprising:

a major panel having an area generally equal to a cross-
sectional area of one tier of the group of at least
two vertically-disposed tiers, having a front edge and
a rear edge, having at least one channel and a
40 plurality of scored lines non-convergently extending
from said front edge generally toward said rear edge
such that said major panel may be curled about said
channels and said scored lines, defining at least one
aperture positioned so that when said major panel is
disposed within the carton over a lower tier of
articles arranged in an array said apertures are
aligned over the plurality of spaces extending below
45 a plane which intersects the tops of the articles; and

means for releasably securing said major panel within the
50 carton.

6. A divider panel according to claim 5, wherein said major panel has a perimeter configuration generally corresponding to a perimeter configuration of a cross-section of the carton.

55 7. A divider panel according to claim 5, wherein said at least one channel is debossed upon an upper surface of said major panel.

8. A divider panel according to claim 5, wherein said at least one channel is debossed upon a lower surface of said major panel.
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9. A divider panel according to claim 5, wherein said at least one channel extends longitudinally through said major panel along a line contained in a plane of adjacency extending between adjoining rows of articles.

65 10. A divider panel according to claim 5, wherein said at least one channel extends longitudinally through said major panel along a line contained in a plane of adjacency extending between adjoining rows of articles; and

70 wherein said plurality of scored lines comprises at least one skewed scored line beginning at said front edge of said

major panel mediate said channel and a side edge of said major panel most proximate said channel, extending generally toward said side edge of said major panel most proximate said channel.

75 11. The divider panel of claim 5, said means for releasably securing said major panel within the carton comprising a pair of anchor flaps foldably and detachably joined respectively to said front and rear edges of said major panel.

80 12. A divider panel according to claim 11, wherein said plurality of scored lines includes a pair of diametrically opposed skewed scored lines beginning at said front edge of said major panel and wherein said pair of diametrically opposed skewed scored lines extend through said anchor flap which is foldably and detachably joined to said front edge of said major panel.

85 13. A divider panel according to claim 5, wherein said at least one aperture contains a tab removably positioned within said aperture.

90 14. A divider panel according to claim 5, wherein said at least one aperture is proximate said front edge of said major panel.

15. A divider panel according to claim 5, further comprising means for distinguishing a first end of the
95 divider panel from a second end thereof.

16. A divider panel according to claim 15, said means for distinguishing a first end of the divider panel from a second end thereof comprising a notch defined in said major panel proximate one of said front and rear edge thereof.

100 17. A divider panel for separating adjacent tiers of beverage cans in a package having a plurality of beverage cans, each beverage can having a cylindrical can body, the beverage cans arranged into a group of at least two vertically-aligned tiers encased by a carton including top and bottom panels interconnected by side panels, at least one side panel having a removable flap opening proximate the top panel for removing the cans from the carton comprising:

110 a major panel having an area generally equal to a cross-sectional area of a lower tier of the group of at least two vertically-aligned tiers, having a front edge and a rear edge and opposing side edges, having at least one channel longitudinally extending through said major panel between said front and rear edges thereof along a line contained in a plane of adjacency extending between adjoining rows of the beverage cans, having at least one skewed scored line extending from
115

120

said front edge mediate said channel and said side edge most proximate said channel, defining at least one aperture proximate said front edge positioned so that when said major panel is inserted within the carton over a tier of cans arranged in an array said apertures are aligned over spaces between adjacent cans of the tier; and

125

first and second anchor flaps foldably and detachably joined respectively to said front and rear edges of said major panel.

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18. A divider panel according to claim 17, wherein said major panel has a perimeter configuration generally corresponding to a perimeter configuration of a cross-section of the carton.

19. A divider panel according to claim 17, wherein said at least one channel extends through at least one of said first and second anchor flaps.

135

20. A divider panel according to claim 17, said first anchor flap having first oblique side edges, said second anchor flap having second oblique side edges, and said at least one skewed scored line mediate said channel and said side edge most proximate said channel including a pair of diametrically opposed said skewed scored lines extending

140

through said first anchor flap to a leading edge of said first anchor flap.

21. A divider panel according to claim 17, said at least one aperture comprising two apertures.

145 22. A divider panel according to claim 17, wherein said at least one aperture contains a tab removably positioned within said aperture.

150 23. A divider panel according to claim 17, further comprising means for distinguishing a first end of the divider panel from a second end thereof.

24. A divider panel according to claim 23, said means for distinguishing a first end of the divider panel from a second end thereof comprising a notch defined in said major panel proximate one of said front and rear edge thereof.

155 25. A package comprising:

a plurality of beverage cans arranged into a group of at least two vertically-aligned tiers, each of said cans having a generally cylindrical side wall defining a cylindrical axis, said cans in each of said tiers having said axes thereof disposed vertically and parallel to each other;

a carton disposed around an exterior of said group of cans
and including top and bottom panels interconnected by
a pair of side panels to form a tubular structure, and
165 a pair of end closure structures disposed to close
opposite open ends of said tubular structure, said end
closure structures being connected to said tubular
structure and being disposed substantially adjacent
said side walls of said cans of said group along
170 opposite ends of said group, at least one of said side
panels and said end closure structures having a
removable flap opening for removing said cans from
said carton; and

a divider panel disposed between upper and lower adjacent
175 ones of said tiers and in contact with said cans in
said upper and lower adjacent tiers, said divider
panel having

a major panel having an area generally equal to
a cross-sectional area of a lower tier of the
180 group of at least two vertically-aligned tiers,
having a front edge proximate said removable flap
opening of said carton and an opposing rear edge,
having at least one debossed channel
longitudinally extending therethrough along a
185 line contained in a plane of adjacency extending
between adjoining rows of containers and a
plurality of scored lines extending between said

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front and rear edges such that said major panel may be curled about said debossed channels and said scored lines, defining at least one aperture proximate said front edge positioned over a lower of said tiers of cans such that said apertures are aligned over spaces between adjacent cans of said lower of said tiers of cans; and

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means for securing said major panel within the carton.

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26. A package according to claim 25, wherein said major panel has a perimeter configuration generally corresponding to a perimeter configuration of a cross-section of the carton.

27. A package according to claim 25, wherein said plurality of scored lines comprises

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at least one skewed scored line beginning at said front edge of said major panel mediate said debossed channel and said side edge of said major panel most proximate said debossed channel, extending generally toward said side edge most proximate said debossed channel.

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28. A package according to claim 25, said means for securing said major panel within the carton comprising a pair of anchor flaps foldably and detachably joined

respectively to said front and rear edges of said major panel, secured to respective said end closure structures.

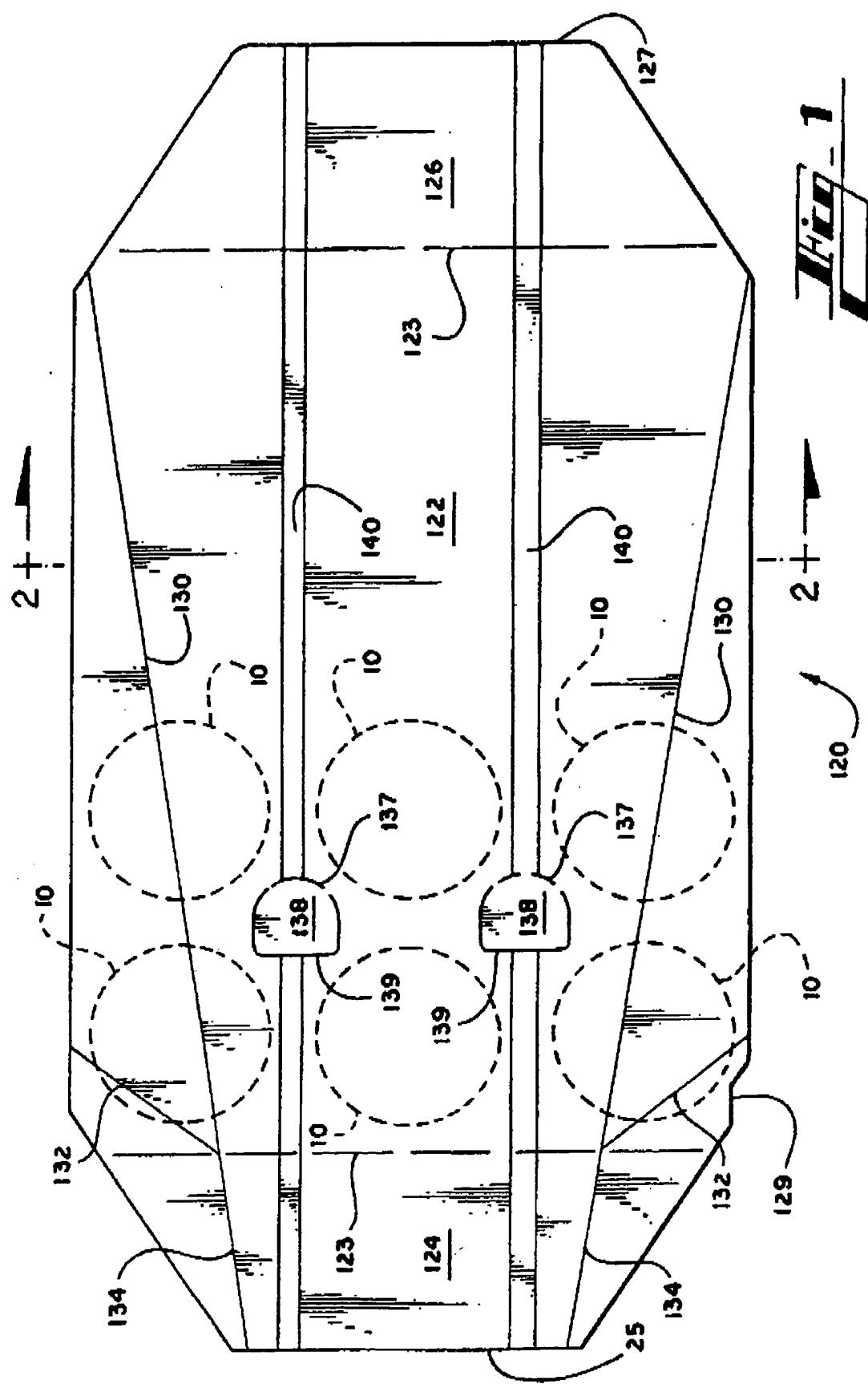
29. A package according to claim 28, wherein said debossed channels extend across at least one of said anchor flaps.

215 30. A package according to claim 28, wherein said plurality of scored lines includes a pair of diametrically opposed skewed scored lines beginning at said front edge of said major panel and wherein said pair of diametrically opposed skewed scored lines extend through said anchor flap
220 which is foldably and detachably joined to said front edge of said major panel.

31. A divider panel according to claim 25, further comprising means for distinguishing a first end of the divider panel from a second end thereof.

225 32. A divider panel according to claim 31, said means for distinguishing a first end of the divider panel from a second end thereof comprising a notch defined in said major panel proximate one of said front and rear edge thereof.

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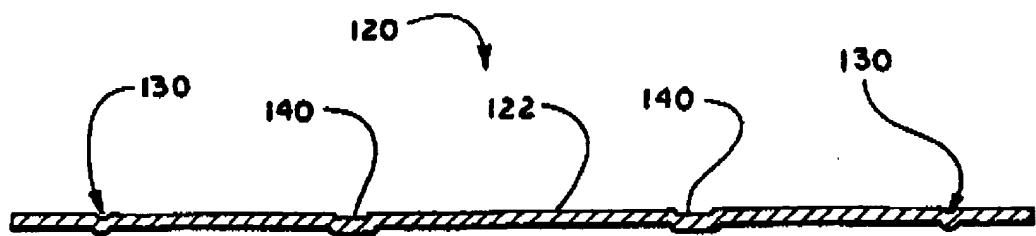


Fig. 2

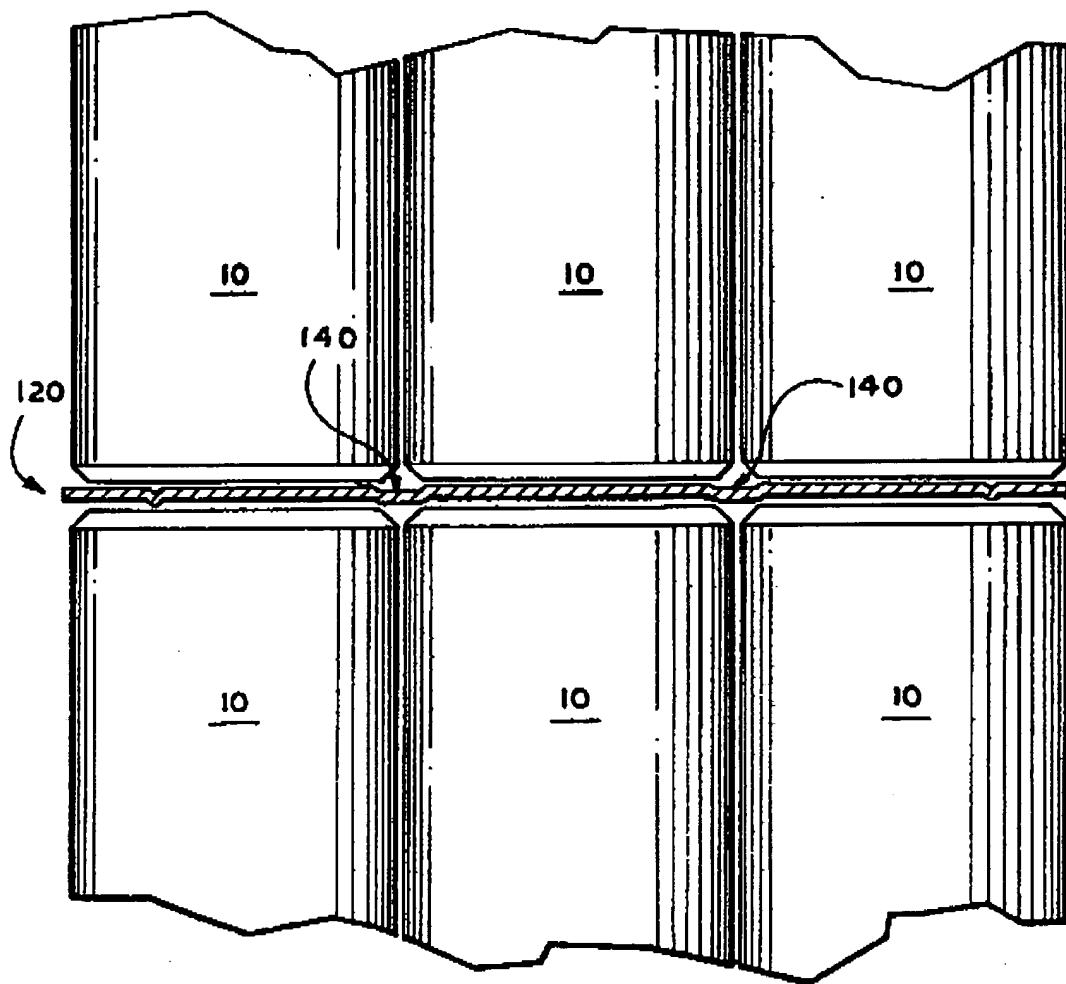
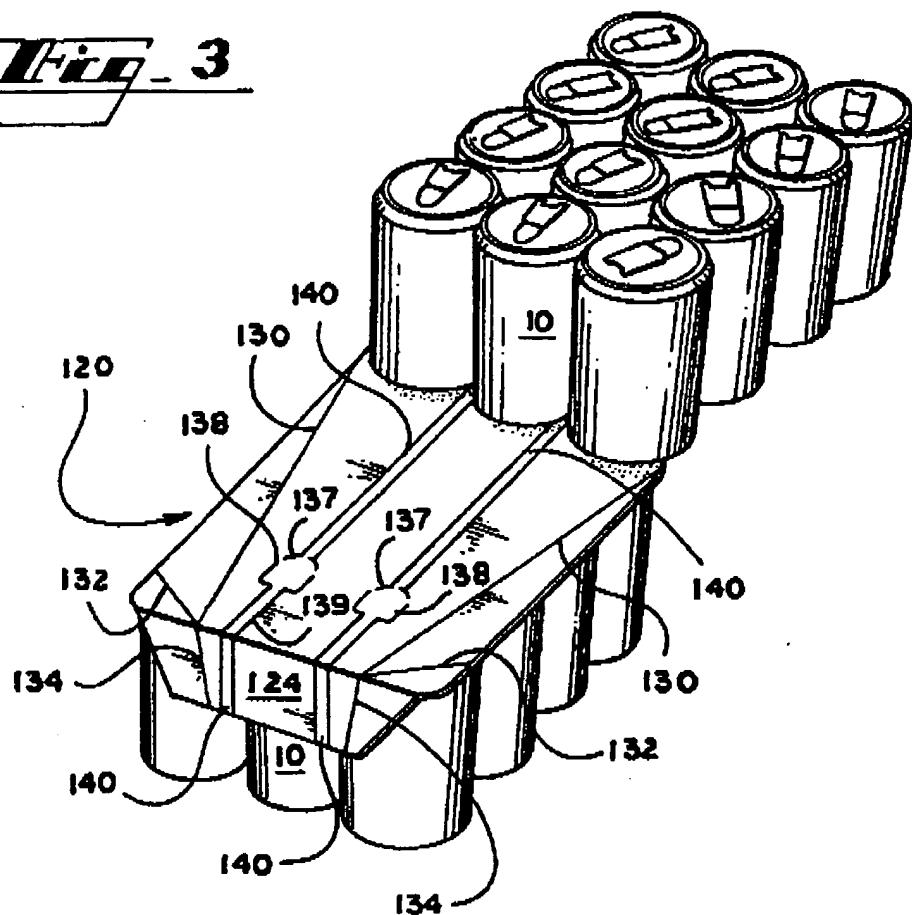
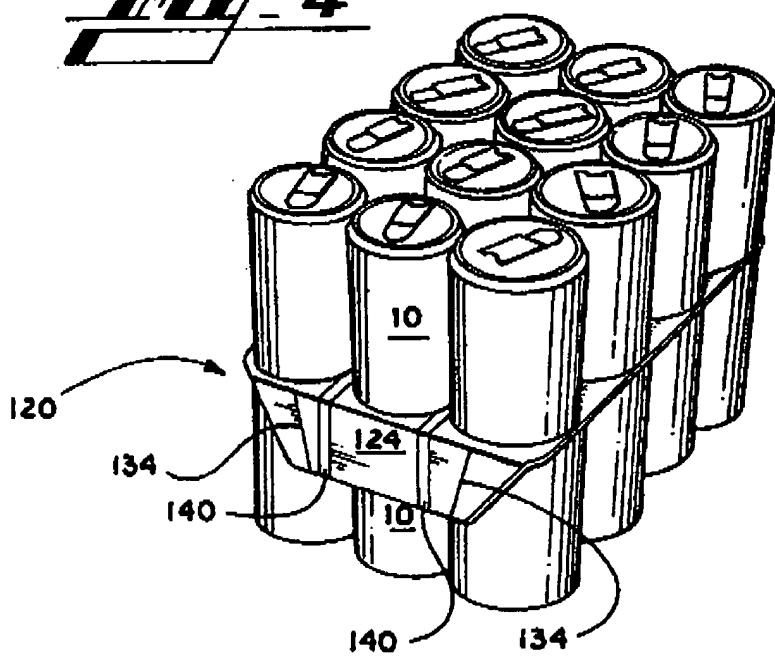


Fig. 5

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FIG. 3***FIG. 4***

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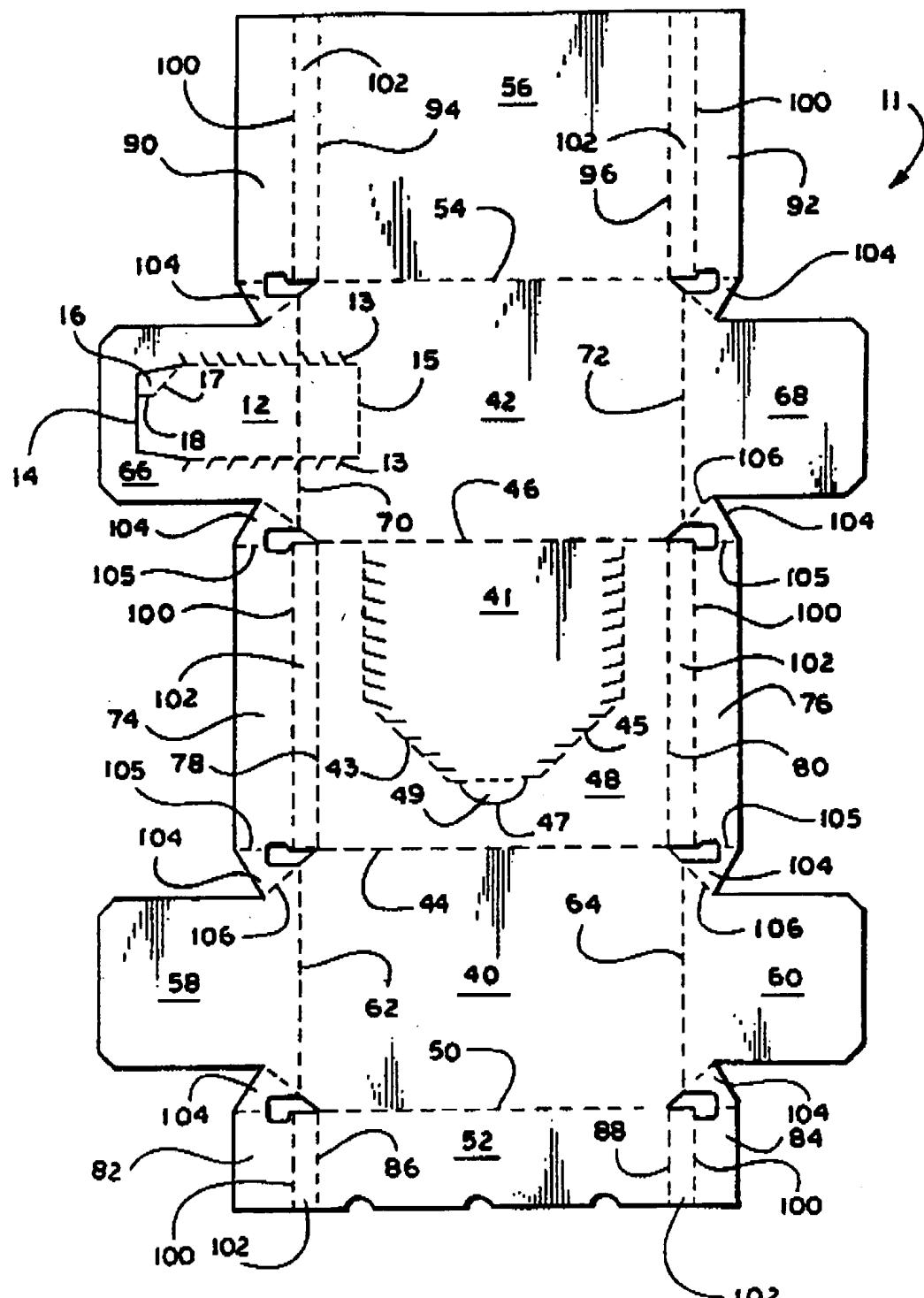
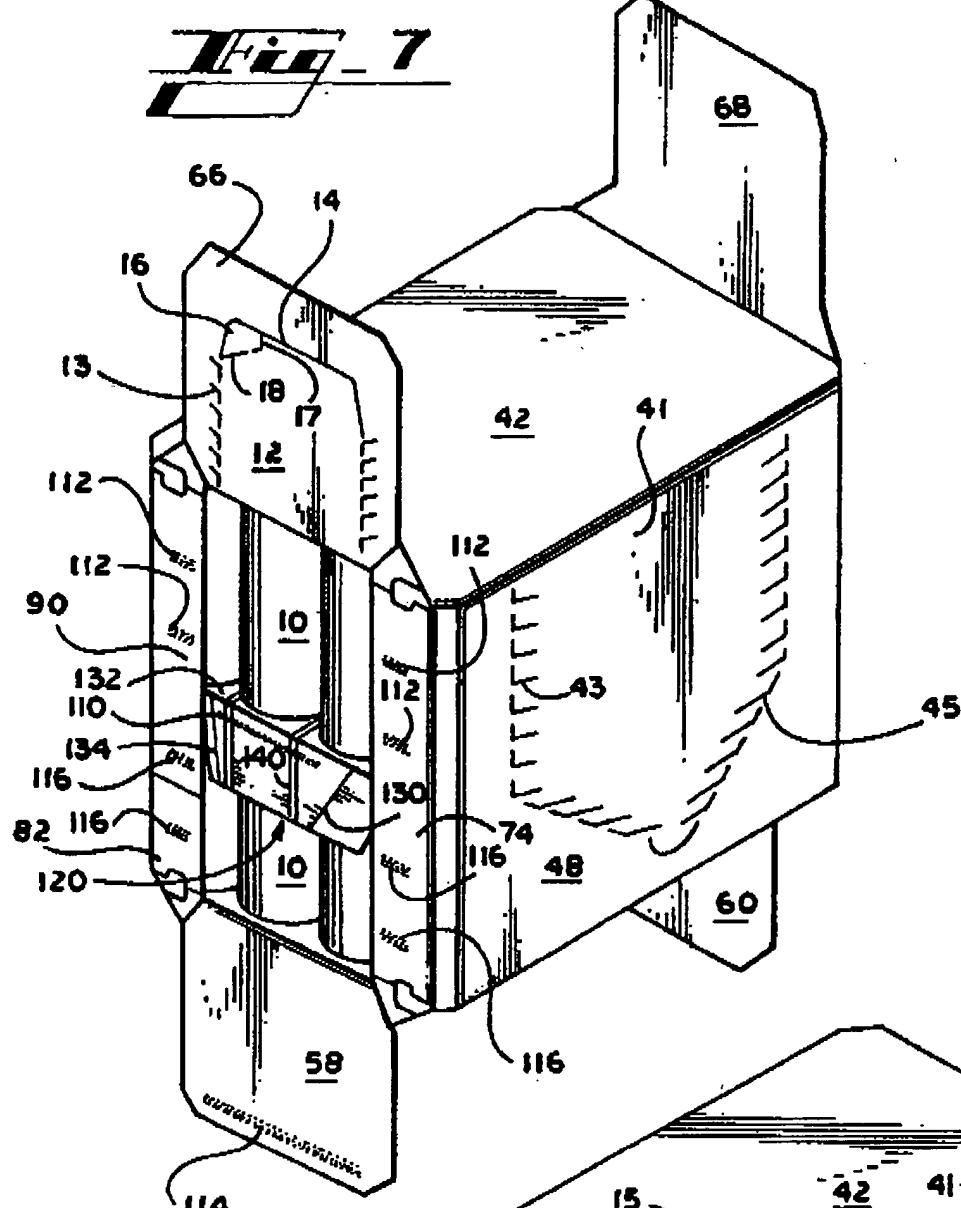


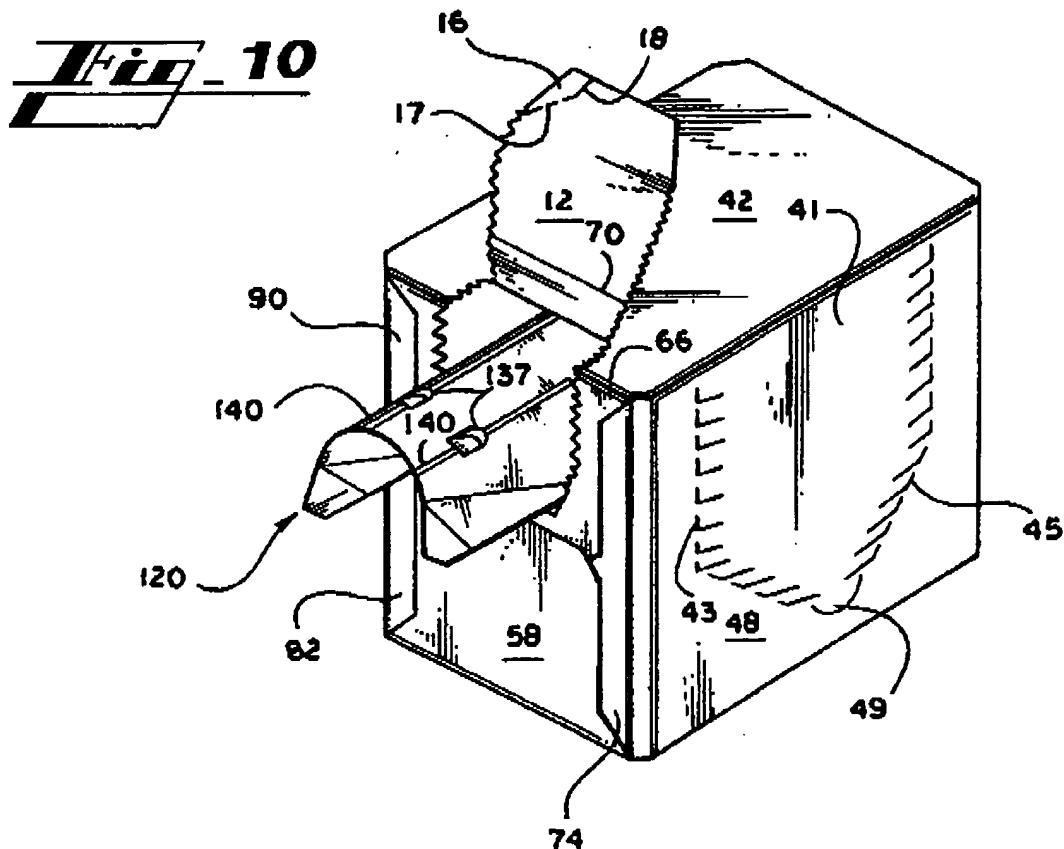
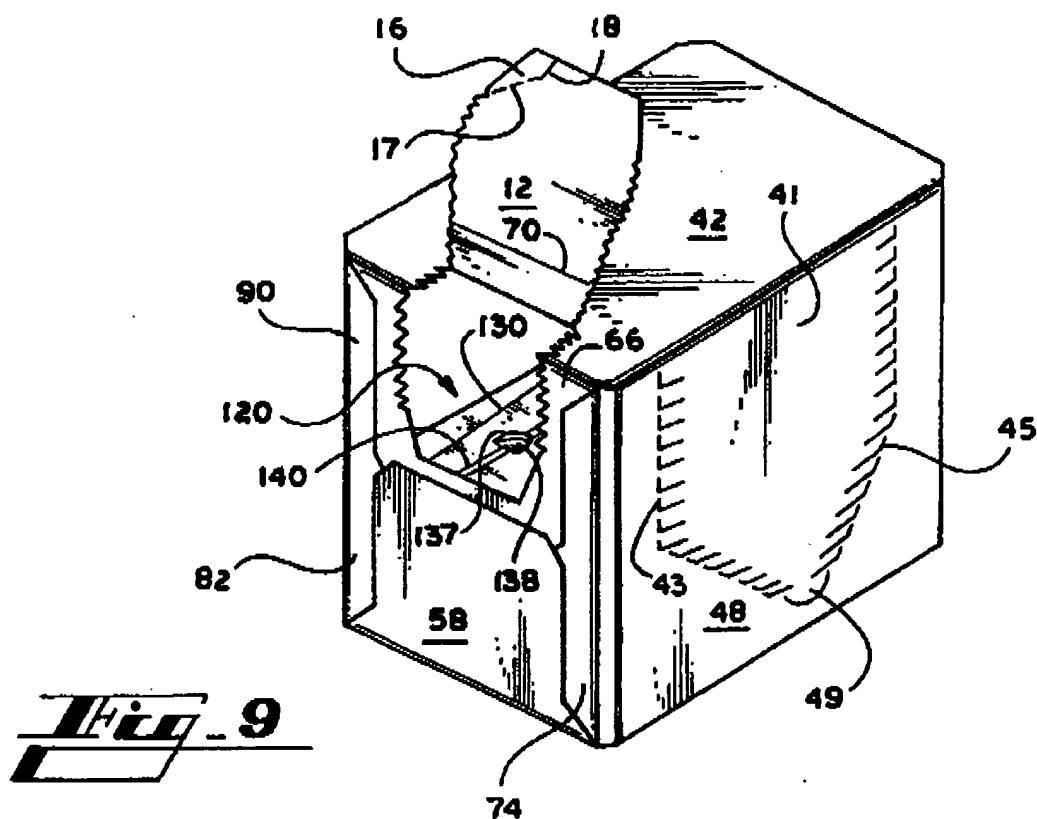
Fig. 6

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This technical drawing shows a cross-sectional view of a mechanical assembly, similar to Fig. 7 but with some differences. It features a vertical column labeled '16' at the top, a bracket labeled '13' on the left, a horizontal plate labeled '42' on the right, and a vertical plate labeled '41' attached to it. A vertical plate labeled '45' is attached to the bottom right. A vertical plate labeled '68' is attached to the top right. A vertical plate labeled '58' is attached to the bottom left. A vertical plate labeled '114' is attached to the bottom center. Components labeled with numbers include 10, 12, 14, 16, 17, 18, 112, 90, 132, 110, 134, 116, 82, 116, 120, 116, 74, 48, 49, and 114.

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INTERNATIONAL SEARCH REPORT

International application No. PCT/US95/03433

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :B65D 65/00, 75/00

US CL :206/427, 160, 194, 196, 430

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 206/427, 160, 194, 196, 430, 151, 152, 158, 161, 197, 593, 821

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,756,419 (LE BRAS) 12 July 1988, entire document.	1-32
Y	US, A, 2,124,808 (WHITE ET AL) 26 July 1938, entire document.	1-32
Y	US, A, 2,919,844 (ANDERSON, JR) 05 January 1960, entire document.	1-12, 14-21, 23-31
Y	US, A, 4,465,180 (KLYGIS) 14 August 1984, entire document.	11, 12, 17-21, 23, 24, 28-30

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reasons (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
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"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 20 JUNE 1995	Date of mailing of the international search report 30 JUN 1995
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Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT	Authorized officer STEVE MEYERS
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Stephen
STEPHEN MARCUS
SPECIAL PROGRAM EXAMINER